

**Abstract**

In an optical communication system that includes a transmitting terminal, a receiving terminal, and an optical transmission path optically coupling the transmitting and receiving terminals and having at least one rare-earth doped optical amplifier therein, a second optical amplifier is provided. The second optical amplifier includes a first portion of the optical transmission path having a first end coupled to the transmitting terminal and a second end coupled to a first of the rare-earth doped optical amplifiers. In addition, the second optical amplifier includes a pump source providing pump energy to the first portion of the optical transmission path at one or more wavelengths that is less than a signal wavelength to provide Raman gain in the first portion at the signal wavelength. After an increase in optical loss in the first portion of the optical transmission path arising from performance of a cable repair thereto, the Raman gain supplied to the optical signal is increased to overcome at least a portion of the increase in optical loss.